**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re PATENT APPLICATION OF:
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Title: CELING PANEL
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**PATENT APPLICATION**
UTILITY PATENT
(INITIAL FILING)

## TITLE OF INVENTION

Ceiling Panel

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## CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

## STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

## REFERENCE TO SEQUENCE LISTING, A TABLE OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

## BACKGROUND OF INVENTION

The use of ceiling panels, particularly but not exclusively for decoration, is well known. Ceiling panels are typically composed of sheet metal with an embossed decorative pattern or of non-metallic material, such as asbestos or cellulose-like materials. The non-metallic ceiling panels have many deficiencies. Consequently metal ceiling panels, particularly those fabricated of tin, are preferred. However, the installation of metal ceiling panels presents challenges.

Most non-suspended ceilings are constructed of sheetrock. Traditionally metal ceiling panels have been installed, that is, affixed to the ceiling, by using nails at the corners or at the perimeter of each individual ceiling panel. However, due to the nature of the composition of sheetrock, nails cannot adequately affix metal ceiling panels to sheetrock due to the inability of nails to adequately grip and hold firmly to the sheetrock and the resultant tendency of the nails to slip-out of overhead sheetrock over a period of time, thereby releasing the panels from the ceiling, which of course is most undesirable.

Consequently, the traditional approach to installing metal ceiling panels to sheetrock ceilings is to first install a plywood surface over the entire sheetrock ceiling, and to then subsequently nail each of the metal ceiling panels into the

thusly installed plywood. This is a labor intensive, time consuming and costly installation procedure.

An alternative but equally undesirable approach is to install wooden strips on the sheetrock ceiling, and to then nail each of the metal ceiling panels into the wood strips. With this approach, it is essential for the wood strips to be aligned very carefully to assure that the strips do in fact align with the edges of the panels as they are installed. Although easier than covering an entire sheetrock ceiling with plywood prior to installation of metal ceiling panels, this wooden strip approach is also still a very a labor intensive, time consuming and costly installation procedure.

In addition, metal ceiling panels traditionally have been installed by being placed side-by-side with each other, without any interlocking mechanism to attach adjoining ceiling panels to each other during the installation process, or indeed otherwise. Such interlocking of contiguous ceiling panels would both facilitate the installation process and would also enhance the structural integrity of the installed metal ceiling panel matrix grid.

The manual dexterity necessary to install ceiling panels overhead is tremendous; not only does the installer need to assure proper alignment of each panel, but that installer must simultaneously also hold and support the panel in an overhead position while handling nails and a hammer.

An objective of the present invention is to solve the aforesaid problems.

**BRIEF SUMMARY OF THE INVENTION**

A preferred embodiment of the invention is the interlocking capability and characteristics of two or more ceiling panels to be installed contiguously with

each other, particularly when installed onto a sheetrock ceiling surface as depicted in Figs. 1 through 6 hereof.

This invention addresses and solves the traditional challenges and problems encountered prior to this invention with the installation of metal ceiling panels by avoiding the costly and time consuming installation of plywood or wooden strips between the sheetrock ceiling and the metal ceiling panels to be attached to that sheetrock ceiling.

This invention further addresses and solves the traditional challenges and problems encountered prior to this invention by the installer having had to simultaneously hold the ceiling panel in place overhead during the installation process, also assuring proper positioning and alignment of each panel, while also handling the affixing nails and operating the hammer by which the nails were driven through the ceiling panel and into the underlying plywood or wood strips.

The present invention solves the foregoing problems. The resultant ability for a ceiling panel to be held in position during installation other than by being continually held in place by the hands of the installer while the installer is simultaneously juggling nails and hammer, coupled with the ability to install metal ceiling panels directly to a sheetrock ceiling without the otherwise need for plywood or wood strips, results in the installation of metal ceiling panels being appreciably less labor intensive, less time consuming and consequently less expensive than otherwise.

## BRIEF DESCRIPTION OF THE DRAWINGS

The illustration of a preferred embodiment of the invention is shown on the accompanying drawings in which:

Fig. 1 is a view of the finished, embossed front face of a representation of a typical ceiling panel.

Fig. 2 is an isometric view of a ceiling panel, looking upward toward a ceiling on which the said ceiling panel is to be installed, simultaneously showing bottom and side perspectives.

Fig. 3 is a depiction of a matrix grid of multiple ceiling panels installed on a ceiling.

Fig. 4 is a cross-section of the male interlock component feature of the invention, not inserted into the female interlock component feature of the invention.

Fig. 5 is a cross-section of female interlock component feature of the invention, without the male interlock component feature of the invention inserted therein.

Fig. 6 is a cross-section of the male interlock component feature of the invention inserted into the female interlock component feature of the invention, showing a series of installed contiguous ceiling panels.

## DETAILED DESCRIPTION OF THE INVENTION

One preferred embodiment of the invention is depicted as a metal ceiling panel in Figs. 1 through 6 hereof, which provides the ability for the installation of a ceiling panel directly into a sheetrock ceiling without the otherwise need for first installing a plywood surface or wood strips to the sheetrock ceiling.

This is accomplished through the combination of an interlocking mechanism within each ceiling panel by virtue of which immediately adjoining ceiling panels

are reversibly and removably connected to each other prior to being affixed to the sheetrock ceiling in conjunction with other ceiling panels then being affixed to the sheetrock ceiling by screws inserted through holes in the flanges of the ceiling panels.

Fig. 1 is a view of the finished front face of a ceiling panel **(101),** in which there are four side edges shown as **(103)**, **(105)**, **(107)**, and **(109)**.

Fig. 2 is an isometric view of the ceiling panel depicted in Fig. 1, but with the side edges which had been depicted in Fig. 1 as **(103)**, **(105)**, **(107)**, and **(109)** now depicted for emphasis in a magnified, out-of-proportion depiction as **(203)**, **(205)**, **(207)**, and **(209)**.

Fig. 3 is a depiction of a matrix grid **(310)** comprised of twelve of the ceiling panels **(101)** depicted in Fig. 1. The use of twelve ceiling panels in this matrix grid is only for purposes of illustration, with the matrix grid actually being any number of ceiling panels configured in an interconnected matrix grid of such ceiling panels.

Fig. 4 depicts a cross-section of the male interlock component feature of the invention **(401)**, in which there are both convex protrusions **(403)** and **(405)**, and also resultant concave indentations **(407)** and **(409)** from the plane of the male interlock component feature of the invention **(401)**.

The use of two such protrusions and two such indentations is only for purposes of illustration, with the actual number of such protrusions and indentations being one or more, but certainly not limited to two.

The surfaces of protrusions **(403)** and **(405)** can be either smooth or alternatively can be coated, treated or otherwise conditioned or textured to thereby increase the coefficient of friction between said surfaces **(403)** and **(405)** with the surfaces

of any materials with which they are placed in contact, including the surface of the interior wall **(511)** of the female interlock component feature of the invention.

Similarly, the surfaces of indentations **(407)** and **(409)** can be either smooth or alternatively can be coated, treated or otherwise conditioned or textured to thereby increase the coefficient of friction between said surfaces **(407)** and **(409)** with the surfaces of any materials with which they are placed in contact, including the surfaces of protrusions **(507)** and **(509)** on the surface of the interior walls **(511)** of the female interlock component feature of the invention.

Fig. 5 depicts a cross-section of the female interlock component feature of the invention **(501)**, in which there are both convex protrusions **(507)** and **(509)**, and also resultant concave indentations **(503)** and **(505)** from the plane of the female interlock component feature of the invention **(501)**.

Fig. 5 also depicts a relatively flat surface **(511)** facing and directly opposite to surfaces of protrusions **(507)** and **(509)**.

In addition, Fig. 5 depicts a hole **(513)** through which a screw or other affixing means may be inserted to affix the ceiling panel, of which the female interlock component feature of the invention **(501)** is a part, onto a sheetrock ceiling.

The use of two such protrusions and two such indentations is only for purposes of illustration, with the actual number of such protrusions and indentations being one or more, but certainly not limited to two.

The surfaces of protrusions **(507)** and **(509)** can be either smooth or alternatively can be coated, treated or otherwise conditioned or textured to thereby increase the coefficient of friction between said surfaces **(507)** and **(509)** with the surfaces of any materials with which they are placed in contact, including the surfaces of indentations **(407)** and **(405)**.

Fig. 6 depicts a cross-section of portions of two ceiling panels **(601)** and **(605)**, each of which is connected to the depicts the entire ceiling panel **(603)**.

Each ceiling panel in that preferred embodiment depicted in the Figs. 1 through 6 hereof has two male side edges **(207)** and **(209)** and two female side edges **(203)** and **(205)**. One or more holes **(211)** exist in each flange portion of the said male side edges **(203)** and **(205)** to allow for the insertion of a screw or other affixing means by which the ceiling panel is affixed to a sheetrock ceiling.

In the installation process, the said male side edges **(207)** and **(209)** are inserted into the female side edges **(203)** and **(205)**, respectively. The said ceiling panels, when thusly connected with each other, interlock in a "snap-lock" fashion, thereby self-aligning themselves with other ceiling panels previously installed in the matrix grid **(301)** and providing a means for the ceiling panels subsequently installed to be similarly self-aligned.

In addition, once so connected and interlocked the said ceiling panels are relatively self-supporting, and need no longer be held in the hands of the installer. Consequently, the installer then has both of his hands free to use for holding nails, screws, hammers, screw drivers or any other tools used to affix the ceiling panel matrix grid to the sheetrock ceiling.

As the male interlock component feature of the invention as depicted in Fig. 4 is inserted into the female interlock component of the invention as depicted in Fig. 5, (as shown fully inserted in Fig. 6), surfaces **(407)** and **(403)** are initially placed in contact with surfaces **(509)** and **(511)**, respectively, and as the insertion continues, those surfaces **(407)** and **(403)** are then and finally placed in contact with surfaces **(507)** and **(511)**, respectively, while simultaneously surfaces **(409)** and **(405)** are then and finally placed in contact with surfaces **(509)** and **(511)**, respectively.

During and in the course of the aforedescribed insertion procedure, the said protrusions and indentations [**(403)**, **(405)**, **(407)**, **(409)**] of the said male interlock component feature of the invention **(401)** and the said protrusions an indentations [**(503)**, **(505)**, **(507)** and **(509)**] of the said female interlock component feature of the invention **(501)** are temporarily plastically flexibly displaced or deformed, or both, to thereby allow for the said insertion, after which insertion the said protrusions and indentations return to their original shapes and forms.

Upon completion of the said insertion procedure, there is a resulting secure interlock between the two adjacent ceiling panels thus connected. Notwithstanding the said interlock, the said connected ceiling panels are still forcibly separable by applying sufficient force to one ceiling panel in a direction which is opposite to that simultaneously applied to the other then connected second ceiling panel.

Each ceiling panel **(101)** in the matrix grid **(301)** is affixed to the ceiling by means of screws **(607)** inserted through screw holes **(513)** [also shown as **(211)** in Fig. 2].

It is contemplated that the inventive concepts herein described may be variously otherwise embodied and it is intended that the appended claims be construed to include alternative embodiments of the invention except only insofar as limited by prior art.